

**MAINTAINING A DOUBLE-ENDED QUEUE IN A CONTIGUOUS ARRAY
WITH CONCURRENT NON-BLOCKING INSERT AND REMOVE
OPERATIONS USING A DOUBLE COMPARE-AND-SWAP PRIMITIVE**

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ABSTRACT OF THE DISCLOSURE

[1050] An array-based concurrent shared object implementation has been developed that provides non-blocking and linearizable access to the concurrent shared object. In an application of the underlying techniques to a deque, the array-based algorithm allows uninterrupted concurrent access to both ends of the deque, while returning appropriate exceptions in the boundary cases when the deque is empty or full. An interesting characteristic of the concurrent deque implementation is that a processor can detect these boundary cases, e.g., determine whether the array is empty or full, without checking the relative locations of the two end pointers in an atomic operation.